

Geologic Contacts

Figure 1: Physiographic Features and Bedrock Contacts

Figure 2: Scaled Cross-Section A-A'

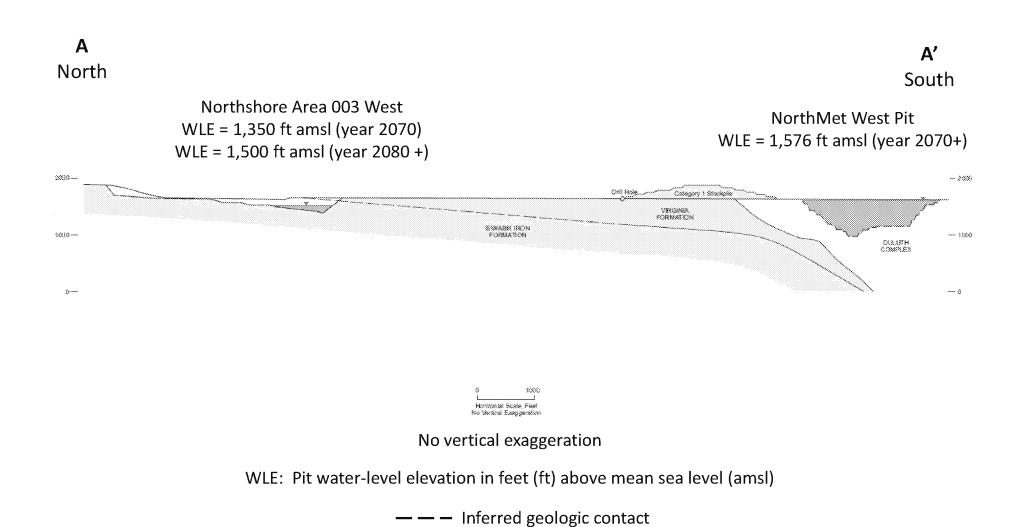
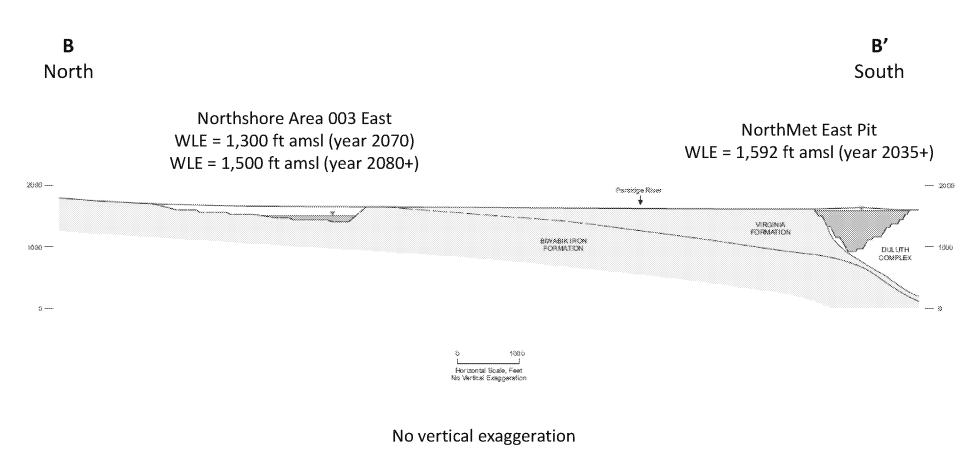


Figure 3: Scaled Cross-Section B-B'



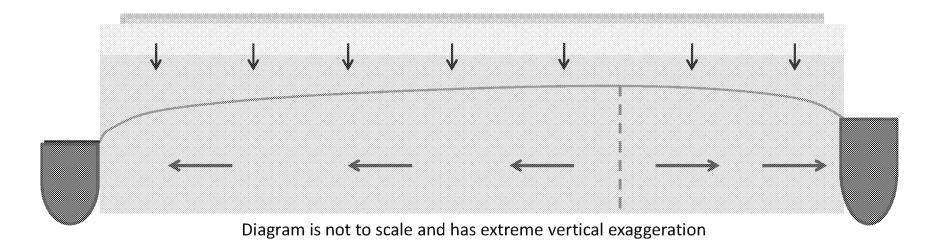
WLE: Pit water-level elevation in feet (ft) above mean sea level (amsl)

─ ─ ─ Inferred geologic contact

Figure 4: Conceptual Model with Sufficient Leakage to Create a Bedrock Groundwater Mound

Northshore Area 003 East WLE = 1,300 ft amsl (year 2070) WLE = 1,500 ft amsl (year 2080+)

NorthMet East Pit WLE = 1,592 ft amsl (year 2035+)



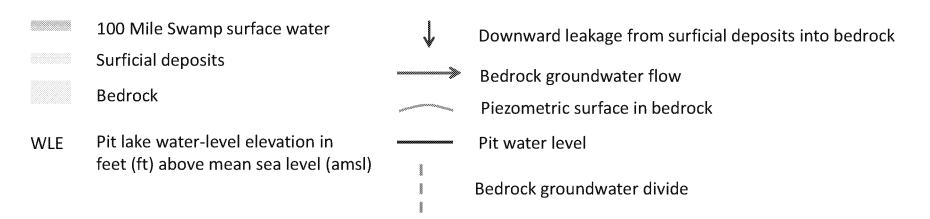


Figure 5: Conceptual Model with Negligible Leakage

Northshore Area 003 East WLE = 1,300 ft amsl (year 2070) WLE = 1,500 ft amsl (year 2080+)

NorthMet East Pit WLE = 1,592 ft amsl (year 2035+)

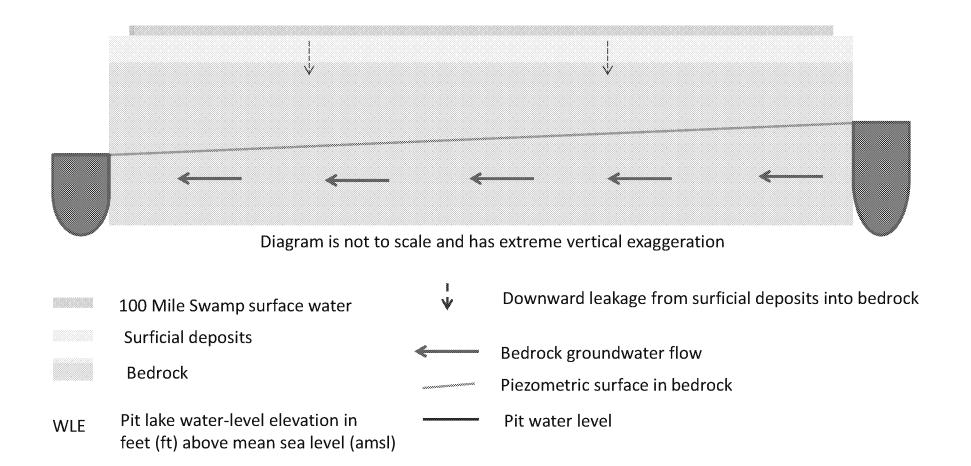


Figure 6: Response in NorthMet Bedrock Wells Compared to Water Level Changes at Northshore

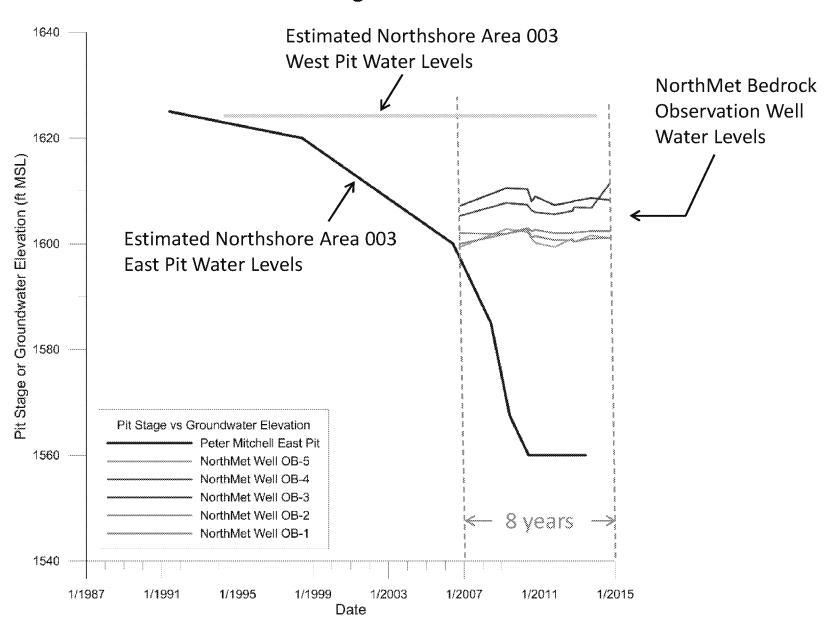
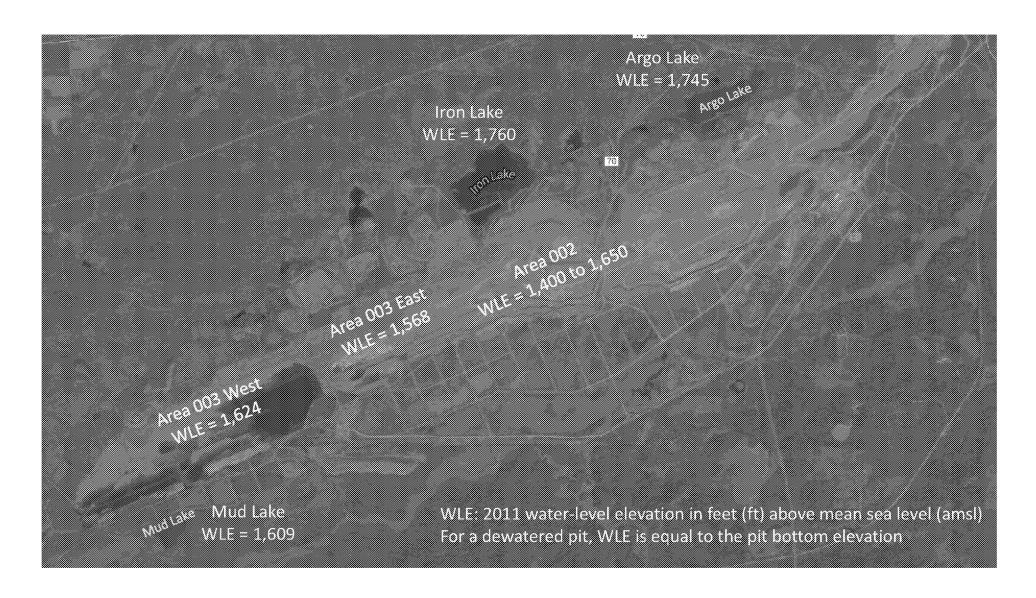


Figure 7: Lakes Adjacent to Northshore Mine Pits



6 40 Δ 36 5 Iron Lake -Argo Lake 32 4 Water Level (ft, relative to initial record) △ Annual Precip (Babbitt) 28 3 Annual Precipitation (in) 2 20 16 12 -2 8 -3 4 0 Jan-50 Jan-78 Jan-48 Jan-49 Jan-53 Jan-55 Jan-56 Jan-58 Jan-59 Jan-60 Jan-61 Jan-62 Jan-63 Jan-64 Jan-65 Jan-66 Jan-68 Jan-69 Jan-70 Jan-71 Jan-72 Jan-73 Jan-74 Jan-75 Jan-76 Jan-79 Jan-80 Jan-81 Jan-47 Jan-51 Jan-52 Jan-54 Jan-57 Jan-67 Jan-77 Calendar Year

Figure 8: Historic Water Levels in Iron Lake and Argo Lake (1946-1981)

AREA 003 EAST PITS AREA 003 WEST RITS CLOQUET/PITS Proposed Bedrock Monitoring Wells Mine Layout - Year 11 Co-Lead Agency Recommended Bedrock NorthMet Mine Site Mine Pit Groundwater Monitoring Well Peter Mitchell Pit Areas Active Stockpile 7,000 DNR Mining Features, 2013 Removed Stockpile PolyMet Owned/Leased Area USFS Federal Land Exchange Parcel ---- Groundwater Containment System \* Note: additional groundwater monitoring wells may be stipulated during permitting

Perimeter Dike

Figure 9: PolyMet Proposed and Co-Lead Agency Recommended NorthMet Bedrock Groundwater Monitoring Wells\*

Figure 10: Conceptual Hydraulics for a Lowered East Pit Water Level

Northshore Area 003 East WLE

NorthMet East Pit WLE less than Northshore Area 003 East WLE

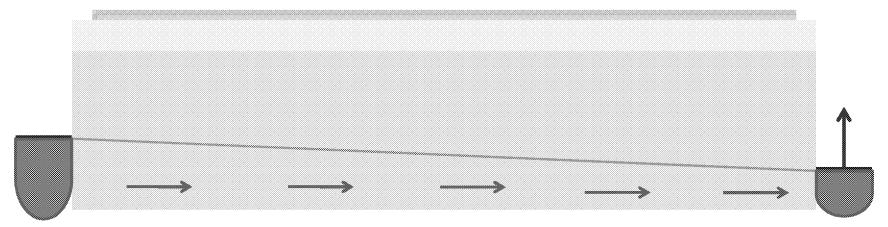
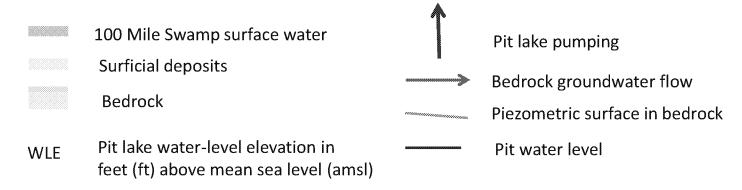
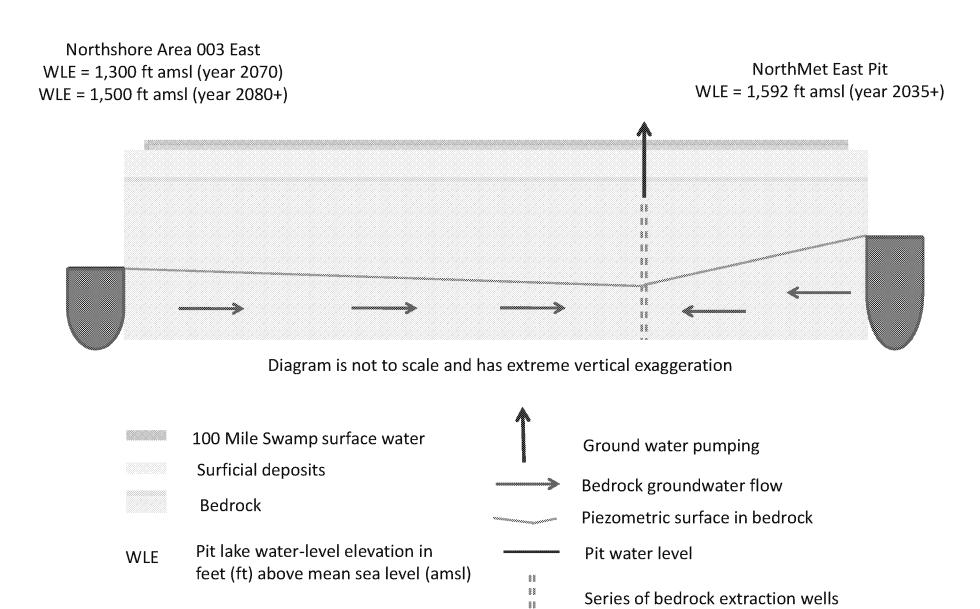


Diagram is not to scale and has extreme vertical exaggeration



<sup>(</sup>a) Note: the water level in the East Pit can be temporarily depressed during refill (by pumping) to prevent a north flowpath from developing while other mitigation options are being evaluated and/or implemented

Figure 11: Conceptual Hydraulics for a Groundwater Collection System



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Figure 12: Conceptual Hydraulics for an Artificial Groundwater Mound

